

Application No.: 10/500,393
Amendment Dated: September 4, 2007
Reply to Office Action of: July 3, 2007

MAT-8559US

Amendments to the Specification:

Please replace the paragraph, beginning at page 2, line ¹⁴16, with the following rewritten paragraph:

Yes
5/2/08

According to the present invention, in the piezoelectric vibrator where polarization of a piezoelectric plate points in a direction of a thickness, electrodes are formed at both faces of the piezoelectric plate. Furthermore, dielectric films are formed at the both faces of the piezoelectric plate. In addition, these dielectric films are substantially symmetric with respect to a point across the piezoelectric plate and geometrically similar, and substantially have the same thickness. ~~In other words, the dielectric films are symmetric with respect to a diagonal line extending through the center of the piezoelectric plate.~~ The piezoelectric plate employs thickness longitudinal vibration as principal vibration.



Appln. No.: 10/500,393
Amendment Dated: April 13, 2006
Reply to Office Action of: January 13, 2006

MAT-8559US

Amendments to the Specification:

Please replace the paragraph, beginning at page 8, line ~~27~~¹¹, with the following rewritten paragraph:

yes
5/2/08

A band-pass filter, which can pass signals in specific frequencies, is known to be produced by combining a plurality of piezoelectric vibrators. In general, a ladder type filter, which uses a resonance frequency or an anti-resonance frequency of a vibrator as a pole of a filter characteristic and uses an interval between the resonance frequency and the anti-resonance frequency as a pass band, is provided. Fig. 4 shows an electrical equivalent circuit of the ladder type filter using two piezoelectric vibrators 11501.

Please replace the paragraph, beginning at page ~~9~~⁸, line ~~17~~⁸, with the following rewritten paragraph:

yes
5/2/08

Fig. 5 shows ladder type filter 501502 which is formed by a connection shown in the electrical equivalent circuit of Fig. 4. Ladder type filter 501502 uses two piezoelectric vibrators 11501 which uses aluminum nitride as its piezoelectric material and a fundamental mode of thickness longitudinal vibration as principal vibration. Polarization thereof points in a direction of a thickness of a piezoelectric plate. Ladder type filter 501502 is formed of piezoelectric vibrators 11501, external terminal 12 for inputting, external terminal 13 for outputting, external terminal 14 for grounding and bonding wire 15. Each of two piezoelectric vibrators 11501, which are used in ladder type filters 501502, has a laminated structure where dielectric films having substantially the same thickness are disposed at both faces of a piezoelectric plate. Therefore, because the resonance frequency or an electromechanical coupling factor of the piezoelectric vibrator is stable, filter characteristics having a stable band width or the like can be obtained.